REMARKS

Claims 1-13 and 19 are pending in the present Application.

Applicants' claims require the use of cross-linked polymers. These cross-linked polymers comprise as polymerized units a multi-ethylenically unsaturated monomer (i.e. a cross-linking agent). Cross-linked polymers have different properties from other polymers, such as linear polymers. In particular, cross-linked polymers are known for their excellent *stability toward elevated temperatures* and physical stress, and they are dimensionally *stable* under a wide variety of conditions due to their structure. See, Odian, *Principles of Polymerization*, 3rd edition, pg. 109 (1991).

Enclosed herewith is a Declaration of Dr. Richard Clikeman under 37 CFR §1.132 ("the Declaration"). Dr. Clikeman has worked in the polymer field and polymer related areas for over 25 years. In addition to reviewing the Bresling and Babich patents and Odian reference, 2nd edition, cited in the Official Action, Dr. Clikeman has reviewed the Odian reference, 3rd edition (herein after "Odian 3rd").

The Odian references, and specifically Odian 3rd, according to Dr. Clikeman clearly teach that different types of polymers are not necessarily interchangeable. See the Declaration at ¶8. Dr. Clikeman, in ¶9 of the Declaration, discusses the differences between non-cross-linked and cross-linked polymers set forth in the cited portions of Odian 3rd. The Table in ¶9 of the Declaration sets forth these differences. In particular, the last row of the Table shows the flow characteristics of non-cross-linked and cross-linked polymers, which Dr. Clikeman quotes from Odian 3rd. In particular, Dr. Clikeman highlighted that cross-linked polymers possess "*stability toward elevated temperatures*". In contrast, non-cross-linked polymers behave quite differently in that they "soften and flow when heated".

According to Dr. Clikeman, the characteristics of cross-linked polymers in the Tabel in ¶9 would teach one skilled in the art to eschew the use of cross-linked polymers in applications where such polymers need to be thermally removable, i.e. in the processes of Bresling or Babich. See the Declaration at ¶10. In ¶9 and 10, Dr. Clikeman describes, in particular, how the polymer flow characteristics described in Odian 3rd would lead one skilled in the art to use *non-cross-linked* polymers in applications such as those in Bresling or Babich. In Dr. Clikeman's opinion,

"one skilled in the art looking for such an easily thermally removable polymer, particularly in view of the teachings of the Bresling or Babich patents and in view of the teachings in Odian, would not look to a cross-linked polymer. Even if one skilled in the art read the Odian textbook and found that cross-linked polymers existed, such person would not expect, based on the teachings of Odian itself, that cross-linked polymers would work in the Bresling or Babich processes." See the Declaration, ¶11.

Claims 1-13 and 19 have been rejected under 35 USC § 103(a) as being unpatentable over Besling et al. (US 6,562,732) in view of Odian (pg. 18 of *Principles of Polymerization*, 1981, 2nd edition, hereinafter "Odian 2nd") and Allen et al. (US 6,420,441). Applicants traverse this rejection for at least the following reasons.

The Bresling patent only discloses linear polymers. See column 4, lines 3-4, which only disclose polymethyl methacrylate, polystyrene and polyvinyl alcohol. No other polymers are taught or suggested in this patent. As discussed by Dr. Clikeman in the Declaration at ¶6, none of these polymers contain the multi-ethylenically unsaturated monomer (i.e. cross-linking agent) required by Applicants' claims. Further, Bresling et al. make clear that the air gap forming polymer is removed by *heating* (i.e. thermal degradation). See column 4, lines 24-29. Since the air gap forming polymer of Bresling et al. is removed by thermal degradation (i.e., heating), col. 4, lines 27-29, this patent clearly does not suggest the use polymers that are *more thermally stable*. Simply put, there is nothing in this patent that teaches or suggests the use of a thermally stable polymer in a method of forming air gaps. In the Declaration, Dr. Clikeman points out that Odian 3rd clearly teaches that cross-linked polymers are more thermally stable than non-cross-linked polymers. See the Declaration at ¶9. Using more thermally stable polymers, such as cross-linked polymers, is clearly contrary to the teachings of Bresling.

The Odian 2nd reference has been cited simply to show that cross-linked polymers are disclosed in the same reference as other types of polymers and are, therefore, obviously interchangeable. See the Official Action at pages 2-3 which reads: "In the book 'Principles of Polymerization', Odian teaches that polymers may be linear, branched, or cross-linked polymers (p. 18). Hence, it would have been obvious to one with ordinary skill in the art to use a cross-

linked polymer in the process of Bresling because it is one of the most popular polymers used in the industry and because it is taught by Odian." Applicants could not disagree more. A reference has to be considered for all that it teaches. The Odian references make clear that different types of polymers are not necessarily interchangeable. See the Declaration at ¶8. In the Declaration, Dr. Clikeman clearly summarized in the Table in ¶9 the differences between non-cross-linked and cross-linked polymers taught by Odian. In particular, Dr. Clikeman points out that Odian specifically teaches that cross-linked polymers have *more* thermal stability than non-cross-linked polymers. See the Declaration at ¶9 and 10. Such a teaching, as discussed by Dr. Clikeman at ¶10 and 11 in the Declaration, would not lead one skilled in the art to use a cross-linked polymer in the process of Bresling.

The Allen patent has been cited merely to show cross-linkers.

Applicants submit that nothing in the references alone or in combination would lead one skilled in the art to use a more thermally stable class of polymers (i.e., cross-linked polymers) in the process of Bresling where such polymers need to be removed by *thermal degradation*. In fact, Odian clearly teaches that cross-linked polymers have very different characteristics such as increased thermal stability than other types of polymers, such as linear polymers. One skilled in the art reading Odian would not be lead to substitute a cross-linked polymer for a linear polymer in an application where the polymer needs to be readily thermally degradable. In short, there is no motivation in Odian or Bresling to replace the linear polymers of Bresling with a cross-linked polymer. See the Declaration at ¶11. Applicants submit that the Official Action does not make out a prima facie case of obviousness and respectfully request that this rejection be withdrawn.

Claims 1-13 and 19 have been rejected under 35 USC § 103(a) as being unpatentable over Babich et al. (US 6,815,329) in view of Odian (pg. 18 of *Principles of Polymerization*, 1981, 2nd edition) and Allen et al. (US 6,420,441). Applicants traverse this rejection for at least the following reasons.

In the Babich patent, polymers used as the sacrificial material are linear polymers. See column 8, line 57 to column 9, line 8. The particular polymers disclosed in this patent are norbornene polymers, polymethyl methacrylate, polystyrene, polycaprolactone, and

polyacrylamide. As discussed by Dr. Clikeman in the Declaration at ¶7, none of these polymers contain the multi-ethylenically unsaturated monomer (i.e. cross-linking agent) required by Applicants' claims. Other suitable materials for use as sacrificial materials are described in the Babich patent as "low thermal stability versions" of various materials. See column 8, last line, and column 9, line 3. Throughout this patent, the sacrificial material is often referred to as "low thermal stability" material. Thus, one skilled in the art reading Babich et al. would be lead to a sacrificial material that had low thermal stability, i.e. it was thermally removable or degradable. A necessary criteria in Babich is that the sacrificial material be removable. Clearly, the Babich patent does not teach or suggest the use of a *more* thermally stable material. There is nothing in this patent that would motivate one skilled in the art to use or attempt to use a more thermally stable material than those disclosed in Babich et al. See the Declaration at ¶7.

Again, Odian 2nd has been cited merely to show that cross-linked polymers are disclosed in the same reference as other types of polymers, and are, therefore, interchangeable. See the Official Action at page 5, which reads: "In the book 'Principles of Polymerization', Odian teaches that polymers may be linear, branched, or cross-linked polymers (p. 18). Hence, it would have been obvious to one with ordinary skill in the art to use a cross-linked polymer in the process of Babich because it is one of the most popular polymers used in the industry and because it is taught by Odian." Applicants could not disagree more. A reference has to be considered for all that it teaches. The Odian references make clear that different types of polymers are not necessarily interchangeable. See the Declaration at ¶8. In the Declaration, Dr. Clikeman clearly summarized in the Table in ¶9 the differences between non-cross-linked and cross-linked polymers taught by Odian. In particular, Dr. Clikeman points out that Odian specifically teaches that cross-linked polymers have *more* thermal stability than non-cross-linked polymers. See the Declaration at ¶9 and 10. Such a teaching, as discussed by Dr. Clikeman at ¶10 and 11 in the Declaration, would not lead one skilled in the art to use a cross-linked polymer in the process of Babich.

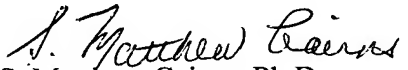
The Allen patent has been cited merely to show cross-linkers.

Applicants submit that nothing in the references alone or in combination would lead one skilled in the art to use a more thermally stable class of polymers (i.e., cross-linked polymers) in

the process of Babich where such polymers need to be removed by *thermal degradation*. In fact, Odian clearly teaches that cross-linked polymers have very different characteristics such as *increased* thermal stability than other types of polymers, such as linear polymers. The Babich patent could not make any clearer statement than that at column 8, lines 27-33, 45-46, and 60-66, and column 9, lines 2-3, that low thermal stability versions of sacrificial materials are used. In view of this teaching in Babich et al., one skilled in the art reading Odian would certainly not be lead to substitute a cross-linked polymer for a linear polymer in an application where the polymer needs to be readily thermally degradable. This is especially true where Odian makes clear that cross-linked polymers are *more* thermally stable than non-cross-linked polymers. See the Declaration at ¶9-11. In short, there is no motivation in Odian or Babich to replace the linear polymers of Babich with a cross-linked polymer. See the Declaration at ¶11. Even if one skilled in the art tried a cross-linked polymer after reading Odian, given the requirement in Babich that the sacrificial material be readily removable (preferably thermally degradable), there is no expectation that the use of a more thermally and dimensionally stable material (i.e. a cross-linked polymer) would work in the method of Babich. See the Declaration at ¶10. Applicants submit that the Official Action does not make out a prima facie case of obviousness and respectfully request that this rejection be withdrawn.

Favorable consideration in the form of a notice of allowance is respectfully requested.

Respectfully submitted,



S. Matthew Cairns, Ph.D.
Attorney for Applicant
Registration No. 42,378
Telephone No: (508) 229-7545
Facsimile No.: (508) 787-4730

ROHM AND HAAS ELECTRONIC MATERIALS LLC
455 Forest Street
Marlborough, MA 01752
Date: February 28, 2006